



A Framework for Assessing Carbon Storage in the Southwestern United States

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The Southwest Regional Partnership

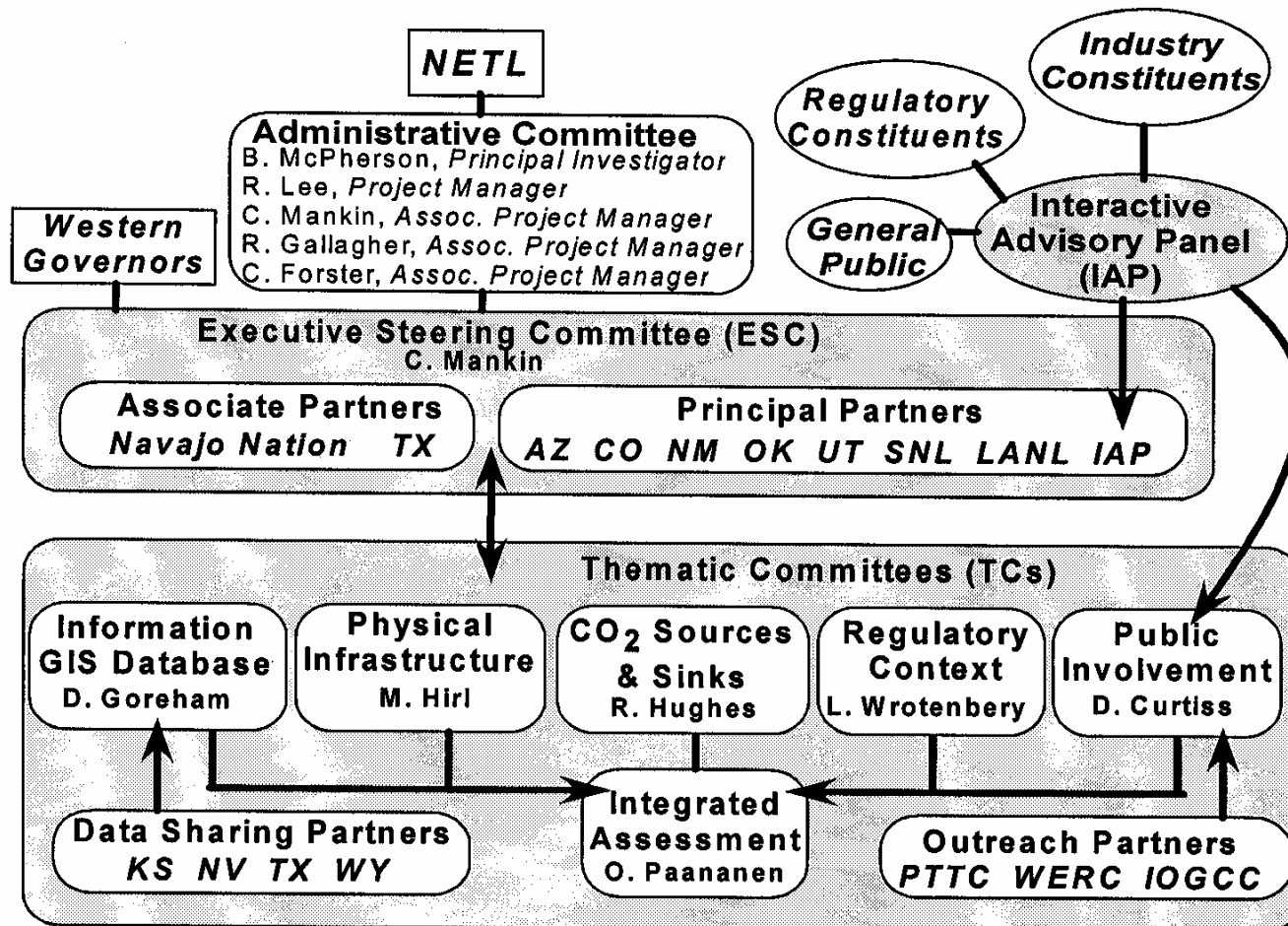
- **The Southwest Regional Partnership is one of six across the U.S.**
 - **Comprised of Arizona, Utah, New Mexico, Colorado, and Oklahoma, and portions of Texas, Wyoming, and Nevada**
 - **Has 44 members, including several universities, state geologic survey offices, state regulatory agencies, electric power producers, oil/natural gas producers, national laboratories, and the USDA**



The Southwest Regional Partnership Objectives

- **Provide the U.S. with prime SW regional candidate options for future large-scale carbon sequestration and deployment opportunities**
- **Identify the most promising sequestration technologies for the SW region**

The Southwest Partnership





Integrated Assessment Committee Objective

- **Provide a model to quantitatively compare alternative sequestration technologies in terms of:**
 - **Costs**
 - **Environmental risks**
 - **Monitoring, verification requirements**
 - **Regulatory, permitting constraints**
- **Establish an integrated assessment framework for non-model elements (e.g., public involvement)**



Model Characteristics

- **Dynamic simulation framework**
- **Track annually to 2025:**
 - **Economic and population growth**
 - **Energy consumption**
 - **CO₂ emissions**
 - **CO₂ sequestration opportunities, potential results**
 - **Life cycle costs of capture, separation, transportation, and sequestration of CO₂**
- **Link GIS database of CO₂ sources and sinks to the economic/population/energy elements**



Model Applications

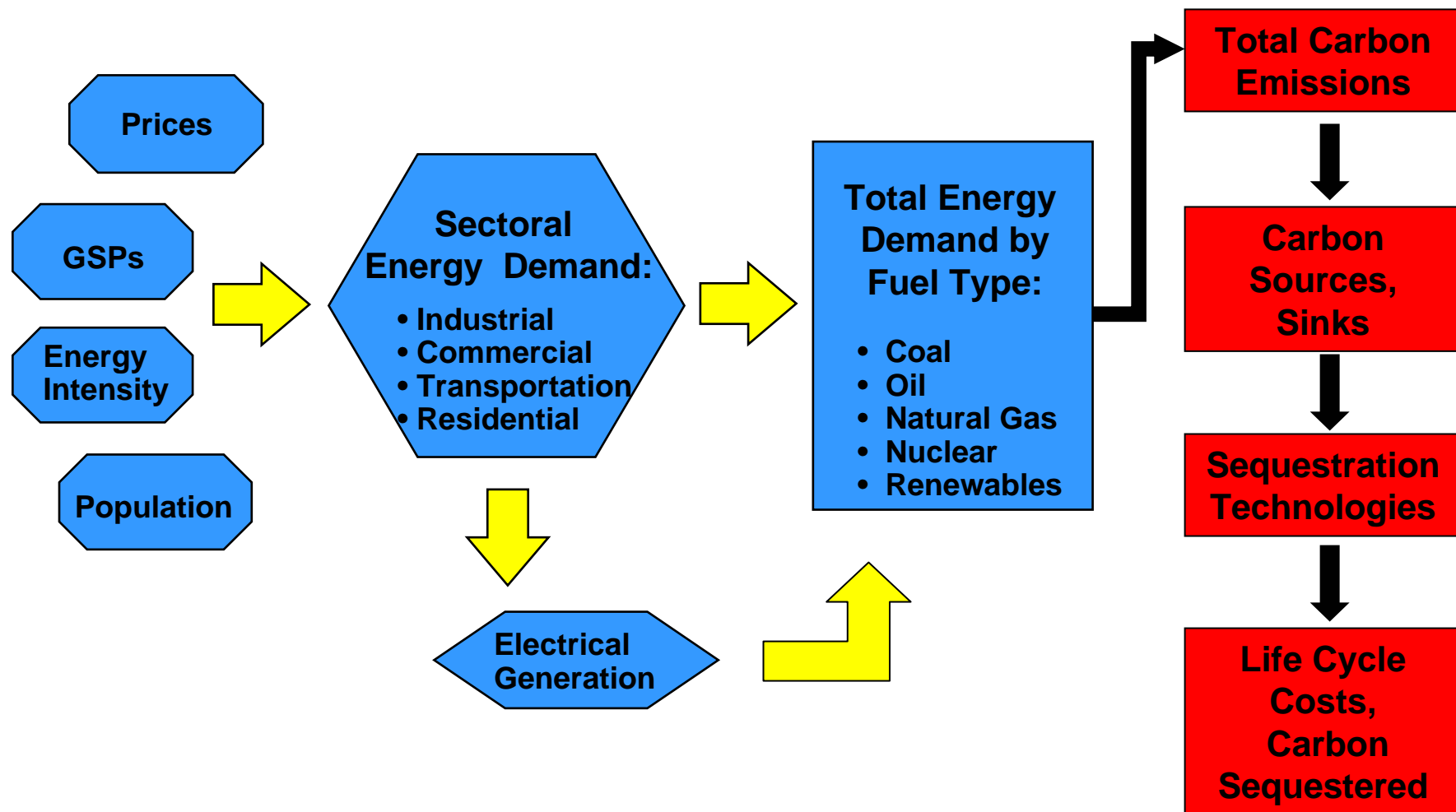
- **Model will allow exploration of “what if” scenarios for alternative:**
 - Technologies
 - Sequestration sites
 - Regional economic, energy conditions
 - Time frames for sequestration
- **Support candidate site and technology selection process**
- **Help in providing public outreach and education**



Current Status

- **Building a regional model based on the Sandia National Laboratories U.S. Energy and Greenhouse Gas Model (USEGM)**
 - **Most of the five-state regional economic, population, and energy use information has been added**
 - **Carbon sources and sinks characteristics and locations are in the process of being added**
 - **Monitoring and verification, risk elements have not yet been established/selected**
 - **Carbon/CO₂ output metrics still under discussion**

The Southwest Regional Carbon Sequestration Model Basic Structure



The Southwest Regional Carbon Sequestration Model: An Illustrative “What If” Screen

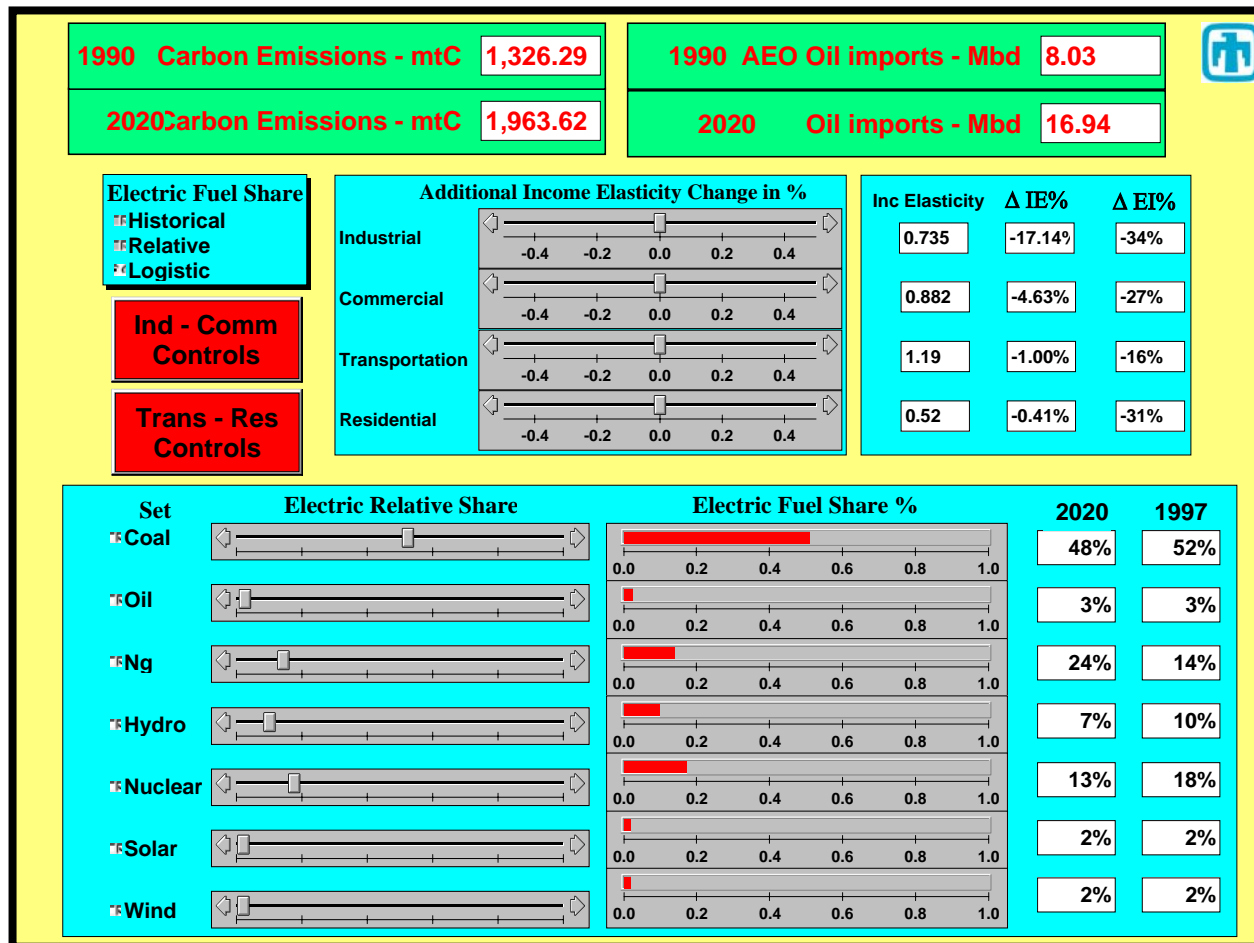
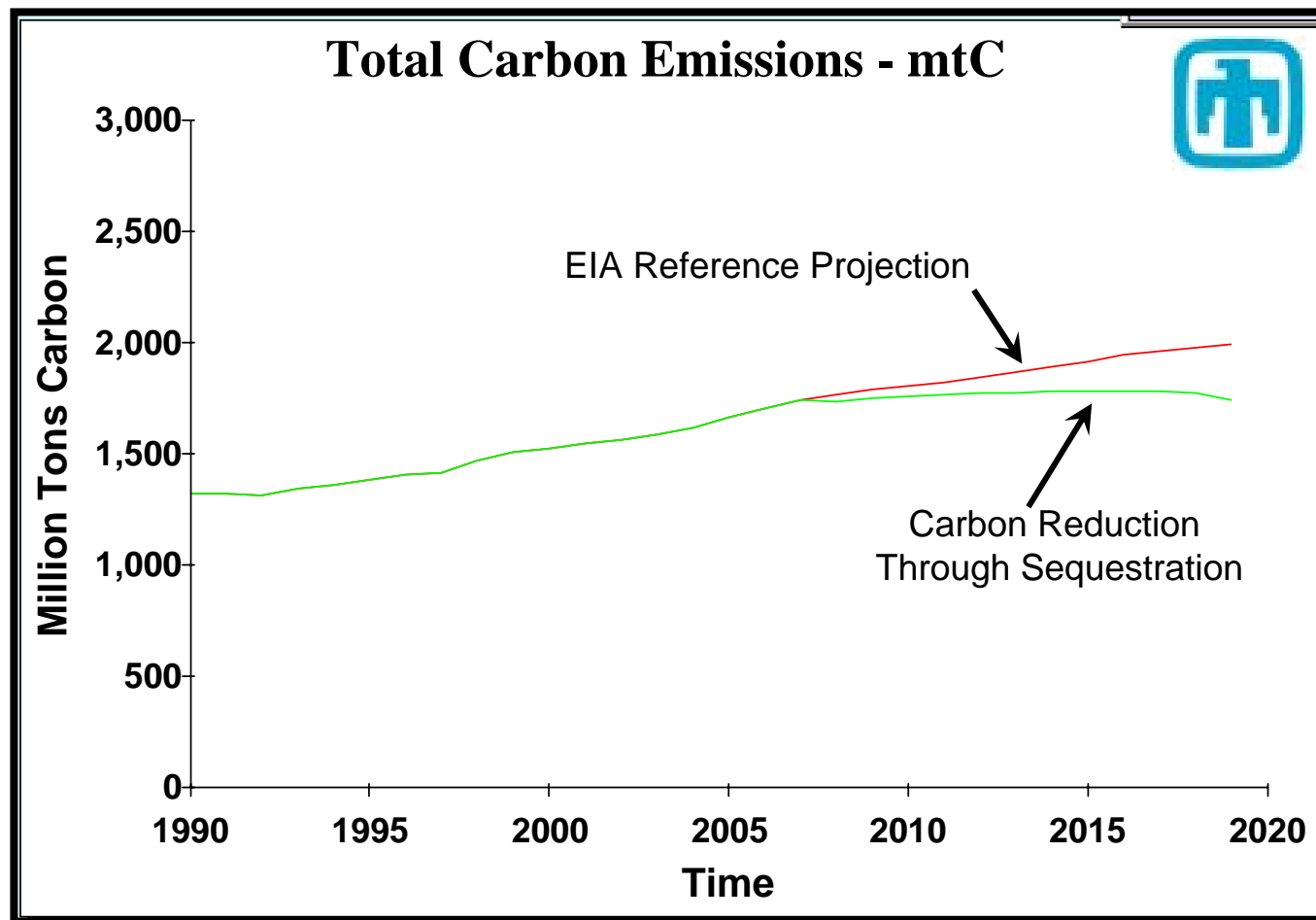


Illustration of U.S. Carbon Emission Reduction through Sequestration





Summary Integrated Assessment Model

- **Will link the SW region energy consumption, production to carbon emissions**
- **Establish “what if” options for different carbon source and sink combinations**
 - Rate of carbon sequestered
 - Amount of carbon sequestered
 - Life cycle costs of sequestration options
- **Provide input to the overall integrated assessment process to establish candidate options for future carbon sequestration opportunities**